

REMARKS**Rejection of Claims 81, 82, 84-112 and 113-122 under 35 U.S.C. § 103**

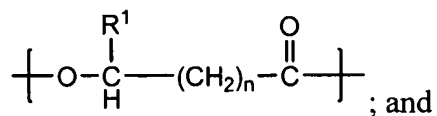
Claims 81, 82, 84-112 and 113-122 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Noda (U.S. Patent No. 6,174,990) in view of Saito *et al.* (*Polymer International* 39 (1996), 169-174). The Examiner stated that "Noda discloses PHA (polyhydroxyalkanoates) are suitable for use as adhesives, in particular Noda recognizes copolymers comprising the claimed 3HB (3-hydroxybutyrate) and 4HB (4-hydroxybutyrate)." Applicant respectfully disagrees with the Examiner's assertion regarding the teachings of Noda. In addition, Applicant's claimed invention is non-obvious over Noda in view of Saito *et al.* for the following reasons.

Applicant's Claimed Invention

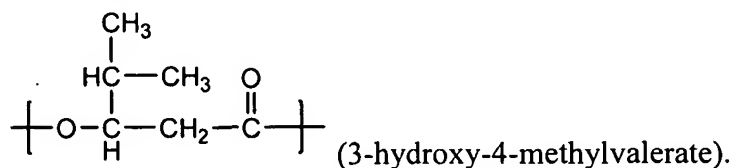
Applicant discovered that poly(3-hydroxybutyrate-co-4-hydroxybutyrate) (PHB4HB) copolymers having certain glass transition temperatures have good adhesive properties. Applicant's claimed invention, as set forth in Claims 81-122, is directed to an article comprising a substrate having a surface and a PHA adhesive composition supported by the surface of the substrate and related methods. The PHA adhesive composition in Applicant's claimed invention is a PHB4HB having a glass transition temperature from about -30 °C to about -5 °C.

Teachings of Noda and Saito et al.

The PHA taught in Noda comprises at least two randomly repeating units (RRMU), wherein the first RRMU has the structure of



the second RRMU has the structure of



Therefore, the PHA taught in Noda must have a RRMU being 3-hydroxy-4-methylvalerate. In the Office Action of February 3, 2009, the Examiner in making the rejection under 35 U.S.C. § 103(a) specifically relied on the teachings at column 6, lines 32-34 and lines 38-40 in Noda.

Column 6, lines 32-34 and lines 38-40 state:

In one embodiment of the present invention, R¹ is a C₁ alkyl and n is 1, thereby forming the monomeric repeat unit 3-hydroxybutyrate.

In another embodiment of the present invention, R¹ is H and n is 2, thereby forming the monomeric repeat unit 4-hydroxybutyrate.

These teachings only refer to specific values for R¹ and n in the first RRMU of the PHA polymer taught in Noda. As such, these teachings specifically describe a PHA copolymer of 3-hydroxybutyrate-co-3-hydroxy-4-methylvalerate and a PHA copolymer of 4-hydroxybutyrate-co-3-hydroxy-4-methylvalerate, *not* “copolymers comprising the claimed 3HB (3-hydroxybutyrate) and 4HB (4-hydroxybutyrate)”, as alleged by the Examiner. Noda further teaches that the PHA taught therein can be used as an adhesive. There is, however, no teaching in Noda that PHA polymers generally would have good adhesive properties. Instead, the teaching of Noda is limited to the 3-hydroxy-4-methylvalerate copolymers.

Saito *et al.* teaches microbial synthesis of poly(3-hydroxybutyrate-co-4-hydroxybutyrate) (PHB4HB) and its properties. It specifically teaches the glass transition temperatures of various poly(3-hydroxybutyrate-co-4-hydroxybutyrate) with different comonomer ratios. As noted by the Examiner, Saito *et al.* also describes that PHB4HB copolymers have various thermal and physical properties, particularly biodegradability. Saito *et al.*, however, does not teach that poly(3-hydroxybutyrate-co-4-hydroxybutyrate) having a glass transition temperature between about -30 °C and -5 °C would have good adhesive properties.

Applicant's Claimed Invention is Non-Obvious over Noda in view of Saito et al.

As discussed above, the teachings of Noda are limited to PHA copolymers having 3-hydroxy-4-methylvalerate as one of RRMUs. Noda also teaches that these PHA may have adhesive properties. However, the only example describing the adhesive properties is prophetic and is limited to poly(3-hydroxybutyrate-co-3-hydroxy-4-methylvalerate) (PHBMV). Moreover,

there is no teaching in Noda that PHA copolymers generally would have adhesive properties. Therefore, one of ordinary skill in the art in view of the teachings of Noda may at best be motivated to use PHA copolymers of 3-hydroxy-4-methylvalerate as adhesives. The skilled person would not reasonably expect that PHA copolymers other than those described in Noda would have adhesive properties, let alone PHB4HB copolymers have glass transition temperatures within a specific range, as in Applicant's claimed invention.

In addition, Saito *et al.* does not remedy the deficiencies of Noda. Although Saito *et al.* teaches the glass transition temperatures of certain PHB4HB copolymers, it does not teach or suggest that the PHB4HB copolymers would have adhesive properties. Moreover, Saito *et al.* does not provide any guidance on selecting specific PHB4HB copolymers having a glass transition temperature from about -30 °C to about -5 °C, as in Applicant's claimed invention, for use as an adhesive. Furthermore, as discussed above, there is no teaching in Noda to suggest that PHA copolymers in general would have adhesive properties. Therefore, in view of the teachings of Noda and Saito *et al.*, the skilled person would not be motivated to modify the PHA copolymers of Noda with the PHB4HB copolymers described in Saito *et al.* for use in an adhesive composition, as in Applicant's claimed invention. Consequently, Applicant's claimed invention, as set forth in Claims 81, 82, 84-112 and 113-122, is non-obvious over Noda in view of Saito *et al.*

Rejections of Claims 83 and 112 under 35 U.S.C. § 103(a)

Claims 83 and 112 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Noda in view of Saito *et al.* and in further view of Marecki (U.S. Patent No. 4,655,768).

Claims 83 and 112 depend from Claims 81 and 111, respectively. As discussed above, Noda alone or in combination with Saito *et al.* does not teach Applicant's claimed articles and related methods of making, wherein the article comprises a PHB4HB copolymer with glass transition temperatures within the specific range recited in the claims as an adhesive.

Marecki teaches bandages and systems for controlled release of transdermally or topically administered drugs. There is no teaching in Marecki of the use of PHB4HB copolymer as an adhesive. Therefore, Marecki does not remedy the deficiencies of Noda and Saito *et al.*,

and consequently, Claims 83 and 112 are non-obvious over Noda in view of Saito *et al.* and Marecki.

Double Patenting Rejection

Claims 81-112 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 12, 16, 19-22, 25-28 and 67 of the co-pending U.S. Application No. 10/783,995 (the '995 Application). The Examiner stated that the '995 Application claims a blend comprising at least a copolymerized PHA, wherein suitable comonomers include 3-hydroxybutyrate and 4-hydroxybutyrate. The Examiner further stated that the '995 Application fails to claim that the blend is capable of functioning as an adhesive coating on a substrate to form an article and the glass transition temperatures, as claimed herein, however, the enabling disclosure at paragraph [0098] and Examples 10-11 makes known this limitation.

Claims 1-113 of the co-pending '995 Application have been canceled and new Claims 114-141 have been added (see Amendments filed by Applicant's agent on July 9, 2008 and on April 29, 2009). New Claims 114-141 are directed to a PHA blend, an article comprising the PHA blend, and methods of making the PHA blend and the article. The PHA blend comprises a first PHA and a second PHA, wherein the first PHA and the second PHA have the same comonomers but with different comonomer ratios. Alternatively, the PHA blend comprises a poly(3-hydroxybutyrate) homopolymer and a poly(3-hydroxybutyrate-co-4-hydroxybutyrate) (PHB4HB) copolymer. None of the new Claims 114-141 provides teaching, suggestion or motivation for the use of PHB4HB copolymer as an adhesive.

Applicant respectfully submit that the Examiner erroneously relied on the specification of the '995 Application in making the double patenting rejection. Section 804, subsection B.1. of the Manual of Patent Examining Procedure (MPEP) states:

When considering whether the invention defined in a claim of an application would have been an obvious variation of the invention defined in the claim of a patent, the disclosure of the patent may not be used as prior art. *General Foods Corp. v. Studiengesellschaft kohle mbH*, 972 F.2d 1272, 1279, 23 USPQ2d 1839, 1846 (Fed. Cir. 1992). (emphasis added)

Therefore, in rejecting Applicant's claimed invention, the Examiner cannot rely on the specification for teachings, suggestion or motivation to modify the invention set forth in the claims of the '995 Application to arrive at Applicant's claimed invention. As such, Applicant's claimed invention is not an obvious variation of the invention set forth in the claims of the '995 Application and Applicant respectfully requests that the nonstatutory obviousness-type double patenting rejection be withdrawn.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By 

Xin Zhang

Registration No. 62,139

Telephone: (978) 341-0036

Facsimile: (978) 341-0136

Concord, MA 01742-9133

Date: June 3, 2009